

What is claimed is:

- 1 1. An inductive write element for use in a magnetic data recording system,
2 comprising:
 - 3 a. a first pole constructed of a magnetic material and having a first end and
4 an opposite second end;
 - 5 b. a second pole constructed of a magnetic material and having a first end
6 and an opposite second end, said second end of said second pole being
7 connected with said second end of said first pole to define a back-gap
8 region and said first end of said second pole being separated from said
9 first end of said first pole by a write gap;
 - 10 c. an electrically conductive coil having a plurality of winds a portion of
11 which pass between said first and second poles;
 - 12 d. an electrically insulating material disposed between said coil and said first
13 and second poles and electrically isolating said coil from said first and
14 second poles; and
 - 15 e. a layer of laminated high magnetic moment (high B_{sat}) material formed on
16 said second pole adjacent said insulating material and extending into said
17 write gap.
- 1 2. An inductive write element as recited in claim 1 further comprising a pedestal
2 constructed of a high magnetic moment material formed on said first pole in
3 said pole tip region.
- 1 3. An inductive write element as recited in claims 1 or 2 wherein said high
2 magnetic moment material includes FeXN, X being selected from the group
3 consisting of Rh, Ta, Al, Ti and Zr.

- 1 4. An inductive write element as recited in claims 1 or 2 wherein said high
2 magnetic moment material has a thickness of one to five times the thickness
3 of said write gap.
- 1
- 1 5. An inductive write element as recited in claim 3 wherein said high magnetic
2 moment material includes lamination layers of a non-magnetic, dielectric
3 material.
- 1
- 1 6. An inductive write element as recited in claim 3 wherein said high magnetic
2 moment material further includes lamination layers of cobalt based
3 amorphous ferromagnetic alloy.
- 1
- 1 7. An inductive write element as recited in claim 6 wherein said cobalt based
2 amorphous ferromagnetic alloy is $\text{Co}_{90}\text{Zr}_9\text{Cr}$.
- 1
- 1 8. An inductive write element as recited in claims 1 or 2 wherein said high
2 magnetic moment material of said second pole has a thickness of roughly
3 0.5 μm and the remainder of said second pole has a thickness of roughly 2 μm .
- 1
- 1 9. An inductive write element as recited in claims 1 or 2 wherein said second
2 pole, exclusive of said high magnetic moment layer is constructed of a
3 ferromagnetic material suitable for plating.
- 1
- 1 10. An inductive write element for use in a magnetic data recording system,
2 comprising:
3 a. a first pole constructed of a magnetic material and having a first end and
4 an opposite second end;

- 5 b. a second pole constructed of a magnetic material and having a first end
6 and an opposite second end, said second end of said second pole being
7 connected with said second end of said first pole to define a back-gap
8 region and said first end of said second pole being separated from said
9 first end of said first pole by a write gap;
- 10 c. an electrically conductive coil having a plurality of windings, a portion of
11 which pass between said first and second poles;
- 12 d. an electrically insulating material disposed between said coil and said first
13 and second poles and electrically isolating said coil from said first and
14 second poles; and
- 15 e. a pedestal formed on said first pole at said first end, and constructed of a
16 laminated high magnetic moment material including laminated FeXN,
17 wherein X is selected from the group of materials consisting of Rh, Ta, Al,
18 Ti and Zr.

1

- 1 11. An inductive write element as recited in claim 10 wherein said pedestal
2 includes lamination layers of a cobalt based amorphous ferromagnetic
3 material.

1

- 1 12. An inductive write element as recited in claim 10 wherein said pedestal
2 includes a layer of Co₉₀Zr₉Cr.

1

- 1 13. A method for constructing an inductive write element for use in a magnetic
2 data recording system, comprising the steps of:

- 3 a. forming a first magnetic pole constructed of a magnetic material;
- 4 b. depositing a first insulation layer;
- 5 c. depositing a layer of dielectric write gap material;

- 6 d. forming an electrically conductive coil;
- 7 e. depositing a second insulation layer;
- 8 f. curing said second insulation layer;
- 9 g. sputter depositing a thin layer of high magnetic moment material;
- 10 h. patterning a second pole;
- 11 i. plating a magnetic material in the pattern of said second pole; and
- 12 j. performing a first ion milling process, to remove at least a portion of the
- 13 sputtered, high magnetic moment material not covered by the plated
- 14 second pole.

1

- 1 14. A method for constructing an inductive write element as recited in claim 13
- 2 further comprising the steps of:
- 3 a. sputter depositing a layer of a high magnetic moment material onto said
- 4 first pole;
- 5 b. masking the high magnetic moment material sputter deposited onto first
- 6 pole in a pattern corresponding to a pedestal to be formed on an end of the
- 7 first pole; and
- 8 c. etching to remove said sputter deposited high magnetic moment material
- 9 not covered by said mask to form said pedestal.

1

- 1 15. A method for constructing an inductive write element as recited in claim 14,
- 2 further including the steps of:
- 3 a. depositing a mask on said plated magnetic material forming said second
- 4 pole, said mask being disposed at an end of said second pole;
- 5 b. performing a second ion milling process to remove a portion of said
- 6 second pole at said end;

- 7 c. performing a reactive ion etching process to remove a portion of said
8 dielectric write gap material layer; and
9 d. performing a third ion milling process to remove a material from said
10 pedestal.

1

- 1 16. A method for constructing an inductive write element as recited in claim 14
2 further comprising the step of polishing said first insulation layer using a
3 chemical mechanical polishing process.

1

- 1 17. A method for constructing an inductive write element as recited in claim 13
2 wherein said high magnetic moment material is sputter deposited FeXN, X
3 being selected from the group of materials consisting of Rh, Ta, Al, Ti, and
4 Zr.

1

- 1 18. A method for constructing an inductive write element as recited in claim 17
2 wherein said high magnetic moment material further includes lamination
3 layers of a cobalt based ferromagnetic amorphous alloy.

1

- 1 19. A method for constructing an inductive write element as recited in claim 18
2 wherein said lamination layers are $\text{Co}_{90}\text{Zr}_9\text{Cr}$.

1

- 1 20. An inductive write element constructed by the method of claim 13 or 14.